Figure 1 Fatty Acid Biosynthetic Pathway

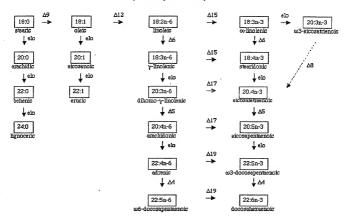


Figure 2
Gene Sequence of Delta 6- Desaturase from Signital gradual (ATOC 56851)

ATGGTCCAGG	GGCAAAAGGC			
GCACAACCGC	CAAGACAACG			
ACATCTCGGC	CTTTGAGGAC			
GCCGGCGAAG	ACGCGACCGA.			
GCTCAAGCTC	CTOSASCAST			
CGGCCGTCGA	CACGTCGATC			
TTCATTGCGT	CGTACCGCAA			
STACSACTOS	AGCAAGCTCT			
GCATTGCGCT	TOTOTCOGCO	GCCATTTGCC	TCCACTTTGA	CTCGACGGCC
ATGTACATGG	TCGCGGCTGT	CATCCTTGGC	CTCTTTTACC	AGCAGTGCGG
CTGGCTCGCC	CATGACTTTC	TGCACCACCA	AGTGTTTGAG	AACCACTTGT
TTGGCGACCT	CETCGGCGTC	ATGGTCGGCA	ACCTCTGGCA	GGGCTTCTCG
GTGCAGTSGT	GGAAGAACAA	GCACAACACG	CACCATGCGA	TCCCCAACCT
CCACGCGACG	CCCGAGATCG	CCTTCCACGG	CGACCCGGAC	ATTGACACGA
TECCHATTCT	COCOTOGTCG	CTCAAGATGG	CGCAGCACGC	GGTCGACTCG
CCCGTCGGGC	TCTTCTTCAT	GCGCTACCAA	SCGTACCTGT	
CTTGCTCTTT	SCGCGTATCT			ATGTACGCCT
TCTACAACGT	TEGGCCCEGC			
CTCGAGCGCG	CCGGCCTCCT			TCGGCCTTGT
GTACGCAGCC	AACATGTCGC			CTCTTTGTGA
GCCAGGCGTC	GTGCGGCCTC			COTCOGCCAC
AACGGCATGG	aggecttega.			TTTGGAAGCT
SCAAGTSCTC	TCGACGCGCA			ATCGACTOST
				CCCGATGGTG
CCCCGGCACA				CGCTCTGCAA
GCAGTACGAC				SECATEGCCE
AGGTCGTCGT	GCACCTCGAG	COCATCTCGA	TCGAGTTCTT	CAAGGAGTTT
CCCBCCATGT	ÀÀ			
	BACAACGE ACATOTEGE CCGGGGAAG CCGGGGAAG CCGGGCACA CTGCATCAACT CTGCATGCAC CTGCATCAC CTGCATGCAC CTGCATCAC CTGCATGCAC CTGCATGCAC CTGCATGCAC CTGCATGCAC CTGCATGCAC CTGCATGCAC CTGCATGCAC CTGCATGCAC CTGCATGCAC CCGGCAC CTGCATGCAC CCGGCACAC CAGATGCAC CCGGGCAC CAGATGCAC CAGATCAC CAGATGCAC CAGATCAC CAGATGCAC CAGATGCAC CAGATGCAC CAGATGCAC CAGATGCAC CAGATGCAC C	ECCESCIGNAS ACSCENCIONA FICATION COTONACIONA CRITCANTOCIO CONTACIONA FILADRACTO ACCATOCA FILADRACTO ACCATOCA FILADRACTO ACCATOCACO CONTECCO CONTECCO	GACACICCIC CAMARACAGG CERRBATCET ACATOTICGE CTTTEBASBAC CACCEGGGGG ECCESCIBAB AGSCEACCBA TEOSITICGET CERCALISCOTT CTOABCAST ACTACTICGE CERCALISCOTT CTOABCAST TEOSITICGET CERCALISCOTT COTRACCAST ACTACTICGE CERCALISCOTT COTRACCAST ACTACTOTT TOATTSCOTT COTRACCAST ACTACTOTT ACTACTACT TOTOTICSBOT CACCETT CATTERACT TOTOTICSBOT CACCETT CATTERACATES TOTOTICSBOT CACCETT CATTERACATES TOTOTICSBOT CACCETT CACCETT COTRACCAST CACCETT COCACCAST COCACCA COCACCAST COCACCA COCACCAST COCACCA COCACCAST COCACCA COCACCAT COCAC	GACALACOR CAMBACAROS CRISGATOST BATCACCAS ACATOCOGOS CTITGABAGAS CACCOSGOGO SOCIOSTATION ACATOCOGOS CTITGABAGAS CACCOSGOGO SOCIOSTATION ACATOCOGO CTITGABAGAS ACACCOGOSO CONTOCOCTO CONTOCOCO CONTOCOCOCO CONTOCOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCOCOCO CONTOCOCOCO CONTOCOCOCOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCOCOCO CONTOCOCOCO CONTOCOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCO CONTOCOCOCOCOCOCOCOCOCO CONTOCOCOCO CONTOCOCOCOCOCOCO CONTOCOCOCO CONTOCOCOCOCO CONTOCOCOCOCOCOCOCOCOCO CONTOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOC

Figure 3
Amino Acid Sequence of Delta 6- Desaturase from Napunkania dicilias (ATCC 56851)

1	MYOGOKAEKI	SWATIREHNR	QUNAWIVIKK	KYYDISAFED	HEGGANME 40
51	AGEDATDAFA	VEHPSSALKE	PEGALACIAN	OSTAAVDTSI	SDEVKKSQSD
101	FIASYRKERL	EYKREGEYDS	SKLYYLYKCA	STESIALYSA	AICLHFDSTA
151	MYMYARYIIG	LE YQQCGW LA	HDE EHHQVE E	NHTEEDEACA	MACHINGER
201	THERMOTHER	HHATPNIHAT	PETAFHGDPD	IDTMPILANS	IKMAQHAVDS
251	PYGLEFMRYO	AYLYF PILIF	ARISWYIQSA	MYAFYNYGPG	GAEDKAÖABE
301	LERAGILLLYY	GHN IG DVYAA	nmselqaaaf	LEVSQASCG L	FLAMVESVEH
351	NGMEVEDINDS	KEDERKIQVI	STRIV TSSLH	IDNEMED IN A	GIDHHIE BWA
401	PRHINEPAGNY	EVKSECKQYD	I PYKE TGEIA	GMAEVVVHLE	RISIEFFKEF
451	PAM*				

Figure 4
Gens Sequence of Delta 5- Desaturase from Napurkania dictina (ATCC 56851)

1	ATGGCCCCGC	AGACGGAGCT	CCGCCAGCGC	CACGCCGCCG	TCBCCGAGAC
51	BCCBBTGGCC	GGCAAGAAGG	CCTTTACATG	GCAGGAGGTC	BCBCAGCACA
1.01	ACACGGCGGC	CTCGGCCTGG	ATCATTATCC	GCGGCAAGGT	CTACGACGTG
151	ACCGAGTGGG	CCAACAAGCA	CCCCGGCGGC	CGCGAGATGG	TGCTGCTGCA
201	CBCCGGTCGC	GAGGCCACCG	ACACOTTCGA	CTCGTACCAC	CCGTTCAGCG
251	ACAAGGCCGA.	GTCGATCTTG	AACAAGTATG	AGATTGGCAC	GTTCACGGGC
301	CCSTCCGAST	TTCCGACCTT	CAAGCCGGAC	ACGGGCTTCT	ACAAGGAGTO
351	CCBCAAGCGC	OTTOGCOAGT	ACTTCAAGAA	BAACAACCTC	CATCCGCAGG
401	ACSSCTTCCC	SESCRICTES	CGCATGATGG	TCGTGTTTGC	66TC6CC66C
451	CTCGCCTTGT			ATCTTTGCGC	
501	BECCECEGE			SCTSCCSCTG	
551	TGCACGACTC		TCSTACACCA		CTTCCATTAC
601	STCSTCSSCC	SCTTTSCCAT	GGACTGGTTT	SCCSSCSSCT	CGATGGTGTC
651	ATGGCTCAAC	CABCACGTCG	TESECCACCA	CATCTACACG	AACGTCGCGG
701	GCTCGGACCC	GGATCTTCCG	GTCAACATGG	ACGGCGACAT	CCGCCGCATC
751	GTGAACCGCC	AGGTGTTCCA	GCCCATGTAC	GCATTCCAGC	ACATCTACCT
801	TCCGCCGCTC	TATESCOTEC	TTGGCCTCAA	GTTCCGCATC	CAGGACTTCA
851				CGATCCGCGT	
901	GCGCTCTCGA	CGTGGATGGC	CATGATCAGC	TCCAAGTCGT	TCTGGGCCTT
951	CTACCECETG	TACCTTCCGC	TTGCCGTGCT	CCAGATGCCC	ATCAAGACGT
1001	ACCTTGCGAT	CTTCTTCCTC	GCCGAGTTTG	TCACGGGCTG	BTACCTCBCB
1051	TTCAACTTCC	AAGTAAGCCA	TOTCTCOACC	Gagtgcggct	ACCCATGCGG
1101				GTGGGCAGTC	
1151	abacotcost	CGACTACGCC	CATGGCTCGT	GGATGACGAC	GTTCCTTGCC
1201	GGCGCGCTCA	ACTACCAGGT	COTOCACCAC	TTOTTCCCCA	GCGTGTCGCA
1251	GTACCACTAC	CCGGCGATCG	CECCCATCAT	COTCGACOTC	TGCAAGGAGT
1301	ACAACATCAA	STACSCCATC	TTGCCGGACT	TTACGGCGGC	GTTCGTTGCC
1351			CATEGGCCAG	CAGGGCATCG	CCGCCACBAT
1401	CCACATGGGC	TAA			

Figure 5
Amino Acid Sequence of Delta 5- Desaturase from Niguralis distins (ATCC 56851)

1	MARQUE LINCR	HAAVAETPVA	GKKAF THOEV	KARAATKHIGA	IIIRGKY YDY	
51			EATDTEDSYH			
101	PSEE PTEKED	TGF YKECRKR	YGE YEKKINI L	RECOGERGER	RMMYYEAVAG	
151	LALYGIME ST	IFALOLAAAA	LIGYCOALPL	LHVMHDS SHA	Sytneephy	
201	VYGREAMDWE	AGG SMVSHIN	CHAACHHILL	NYAGSDPDLP	YMMOGDIRRI	
251	VARIOVE OPINY	AFORIYEPPL	YGY LG IKER I	QUE TOTE GSH	TNG PIRVNPH	
301	ALSTWIAMIS	SKSEHAFYRY	APBPEAAPOMB	IKTYLAIFF L	YELA LCA APY	
351	ENFOYSHYST	ECG YPCGDEA	KMALQDENAV	SQVKTSVDYA	hg shmtte la	
401	GAIN YOUVER	LEPSY SOYHY	PATAPITVDY	CKE YN IK YAI	LPDE TAAFVA	

Figure 6
Gene Sequence of Delta 5- Desaturase from Thinkstein system summin (ATCC 34304)

1 ATEGRACICO GOGGONAGO TULGOTONA ACCIGORAGO TOCACAGO TOCACAGO TOCACAGO ACCIGANAGO ACONCONTRA CONTROLOGO ACCIGANO ACCIGANAGO ACONCONTRA CONTROLOGO ACCIGANO A						
101	1	ATSGGACGCG	GCGGCGAAGG	TCAGGTGAAC	AGCGCGCAGG	TEECACAAGG
151	51	CGGTGCGGGA	ACGCGAAAGA	COATCCTGAT	CGAGGGCGAG	GTCTACGATG
201 COSERCEBEC LASCOSBANA ASPIRACTICAN EMSCRISCOC AMSTROSPOS 201 CROCARGA, SARDAMATIF AGRECARGA BACAGROCIDA COSTRAGADO 201 ATACADOCARGA ANTRAMATIF AGRECARGA BACAGROCIDA COSTRAGADO 201 ATACADOCARGA ANTRAMATIF AGRECARGA BACAGROCIDA COSTRAGADO 201 CACAGRACIA CONTRAMATICA CONTR	101	TCACCAACTT	TAGGCACCCC	GGCGGGTCGA	TCATCAAGTT	TCTCACGACC
251 GOGARCA BATRAMETT GAGGCARS RECASSOCCS SCIENCAGES OF ACCURSON A CONTROLL AND ACCURSON A	151	GACGGCACCG	ASSCIETOSSA	CECEACGAAC	6CGTTTCGCG	AGTTTCACTG
301 ATCARGORAD ATMICSTICAN COTSCIGNAD GRANTSOTOS CORRESPONDO TO CONTROL OF CO	291	CCGGTCGGGC	AAGGCGGAAA	ASTACCTCAA	GASCCTSCCC	AABCTCGGCG
SSI CITCALSCOC GOSCOCOTCO ACATTERCTA CASETTISCO SARACOSCAS 151 SOCIACETCO COSCOCATOC ACATTERCTA CASEGURISCO SALACITETTA 152 SOCIACETCO COSCOCATOC APTOGESSOC ACCESSOCOS SALACITETTA 153 TOTALOGOS COSCOCATOC APTOGESSOC ACCESSOCOS 154 TOTALOGOS COSCOCATOCA CASEGURISCO SALACITETTA 155 ACTUALOGOS COSCOCATOCA 156 ACCURACIÓN COSCOCATOCA 157 TOSSOCAS COSCOCASOCO COSCOCATOCATOCA 157 TOSSOCAS COSCOCASOCO COSCOCATOCATOCATOCA 158 ACTUALOGOS COSCOCASOCO COSCOCATOCATOCATOCATOCA 159 ACTUALOGOS COSCOCASOCO COSCOCATOCATOCATOCATOCATOCATOCATOCATOCATOCA	251	CGCCGAGCAA	GATGAAGTTT	GACGCCAAGG	AGCAGGCCCG	GCGCGACGCG
COTSTTOCK GROUTOSTIC TRACTPETTT CENTROSCOS AMERICATION	301	ATCACGCGAG	ACTACRTCAA	GCTGCGCGAG	GAGATGGTGG	CCGAGGGCCT
401 COCRETICOS GROCTOSTIC TRACTISTITT CENTICOSCOS ABACTISTITO 501 COCRETICOS GROCATORIO RACOSTITUTO CENTICOSCOS GROCETOSIS 501 CTOSCITCATO CACADATICOS BATCACTOTO ARCEACAGOS COCREGISOS 501 CTOSCITCATO CACADATICOS CACACTOTO CARCACCOSO COCCACATO 501 COCREGISOS COCREGISOS CURRITATOS 501 COCREGISOS COCREGISOS CORRECTORIO COCREGISOS 501 ACTUALOS BATCHACIAS CACACACAGO CACACACOSO COCCACATOS 502 COCREGISOS COCREGISOS COCREGISOS COCREGISOS COCREGISOS 503 CACATISTICOS COCREGISOS COCREGISOS COCREGISOS 503 CACATISTICOS COCREGISOS COCREGISOS COCREGISOS 504 CACATISTICOS COCREGISOS CORRECTOS COCREGISOS 505 CACATISTICOS COCREGISOS CORRECTOS COCREGISOS 506 CACATISTICOS COCREGISOS CORRECTOS COCREGISOS 506 CACATISTICOS COCREGISOS CORRECTOS CONTROCTOS CORRECTOS 507 CACACATISTICOS COCREGISOS CORRECTOS CONTROCTOS COCREGISOS 508 CACATISTICOS CORRECTOS CORRECTOS CONTROCTOS CORRECTOS 509 CACATISTICOS CORRECTOS CORRECTOS CONTROCTOS CORRECTOS 500 CACATISTICOS CORRECTOS CORRECTOS CORRECTOS CORRECTOS 500 CACATISTICOS CORRECTOS CORRECTOS CORRECTOS 500 CACATISTICOS CORRECTOS CORRECTOS CORRECTOS 500 COCREGISOS CORRECTOS CORRECTOS CORRECTOS 500 COCREGISOS CORRECTOS CORRECTOS CORRECTOS 500 COCREGISOS CORRECTOS 500 COCREGISOS CORRECTOS CORRECTOS 500 COCREGISOS COCREGISOS CORRECTOS 500 COCREGISOS CORRECTOS 500 COCREGISOS CORRECTOS 500 COCREGISOS 500 COCRE	351	CTTCAAGCCC	GCGCCCCTCC	ACATTGTCTA	CAGGTTTGCG	GAGATCGCAG
151 SOCIAGOTCO COSCIATOSC APTOSOSOSO A TOCSOCIAGO SOCIAGOSOS SOCIATOSCO SOCIAGOS SOCIATOSCO SOCIAGOS SOCIAG		CCCTGTTCGC	GGCCTCGTTC	TACCTGTTTT	CGATGCGCGG	AAACGTGTTC
501 TOGETCHATE CARGAGTEGE BACASTOTTCT BATEASCOSSE TAXTACCOSS 511 TOMACTECCE COTECLERAGE CESSIFICATE GOTTSGERGE GOTTSGERGE TOTALTOTS 512 GOGBOTTGT BEGGERTTCA BCACAACAMS CACCACOSSA COTESCARSA 713 ABBARANCES CONCARSOT BOCKAACAMS CACCACOSSA COTESCARSA 714 ABBARANCES CONCARSOT BOCKACACAMS CONCENTRACES 715 ABBARANCES CONCARSOT BOCKACAGA CONCENTRACES CARROCKET 716 ABBARANCES CONCARSOT BOCKACAGA CONCENTRACES CARROCKET 717 ABBARANCES CONCARSOT BOCKACAGA CONCENTRACES 718 CACCATTEGE CONCENTRACE CONCENTRACE CONTROLLED CONTROLLED CONCENTRACE 719 AFGACACAGA COSSIGNATOTT CACCACATT GOTTSCARSOT CONCARSOT BOCKACAGA CONCARSOT BACTACAGA BATTACAGA CONCENTRACE CACCAGAGA BATTACAGA BATTACAGAGA CONCARSON BATTACAGAGA CONCARSON BATTACAGAGA CONCARSON BATTACAGAGA CONCARSON BATTACAGAGA CONCARSON BATTACAGAGA CONCARSON CONCARS		GCCACGCTCG	CRECCATORC	AGTYCGGGGGGC	ATCGCGCAGG	SCCSCTSCSS
\$31 TIMEMERICO CONSCISSION CTRUPTINGS SOUTHERSOFTS CHOCANDOLOS CONSCISSION SOURCES SOURCE						
501 GOSBOTTBEF BEGGGTTCA GULCHACHAG GLCCAGGGSA COTGEGABAN 511 ACTUAGAGE SAGFTGSAC TOSAGAGGT GUSCTGGTGTGGGGGTGTGTGAGG 701 ABABANTGS GSCGABSTT GGCGGGGT GUTTCAGGG CAMPTGGCTG 701 TOSGGGGGT TIT TEGGGGGGT GUTTCAGGG CAMPTGGCTG 702 TOSGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG						
551 ACTCARECAG GRAFFGRACT CORACACCT GOOGTOFT GOTTCAGOS 701 AGRARANCE GOCCASPOTO GOCCOSPOT GOTTCAGOS CARPGOTO 751 TOGSOCAGO GOTRACTIT TOGSCOCOSPOT GOTTCAGOS CARPGOTOS 751 TOGSOCAGO CORTICATT TOGSCOCOSPOTO TOCTSCOTTCC TOSTTGOTTC 751 TOGTORAGAT GOCOCCOTO GOCOTOGSCO CONTROCOSPOTO ACCASCACT 751 TOGTORAGAT GOCOCCOTO GOCOTOGSCO TOGTOGSCOTO GOCOGOCOTO 752 ACCACTOTOGS TOTTGOTOGAC GOCOTOGSCOTO TOGSCOCOTOGS 753 CACCTOTOGS TOTTGOTOGAC CORACACTOTO CONTROCOTOGSCOTOGSCOTO 753 TAGOSCOCO TOGACACCO CARCATOTOGO COCCOGOCOTO CONTROCOTOGO 753 COCCACO COCCAGOSPOTO COCCOGOCOTO COCOGOCOTO 753 COCCACO COCCAGOSPOTO COCCOGOCOTO COCOGCOTOGO COCOGCOTO COCOCOCOCO 753 TAGOSCOCO COCCAGOSPOTO COCCAGOSPOTO COCOGCOCOTO COCOCOCOCOCOTO COCOCCOCOC						
701 ABABANCS CRICABSTS CROCOSSCT SETTCABSC CARPESCRY 701 TOSSOCASS CHAPTECTS TROCOSSCT SETTCABSC CARPESCRY 301 CTTCTSSAC CHAPTECTS ACCOUNTED TO TOTOTTCT CROTTSSTT CROTTSST 301 ATTACKED CHAPTECTS ACCOUNTED TO TOTOTTCT CROCASCATT 301 ATTACKED TRESCTERA CORRACTOR CROTTSST 301 ATTACKED CROCOS CROCOSCAC CRACCIONAL CROCASCACT 301 ACACCTTSSC TESTCACCACA CRACOSTCC ARTCACTOR CROTTCACTS 101 ACACCTSC CBASCISTAC CRACOSTC ACACACTT SCORTICATE 101 CHAPTECTS TOTACCACA CATTICABNE ARTCATECH CROCASCAC 102 ACACCTTSCAND CROCASCAC CRACOSTCC 103 ACACCT CRACOSTC CRACCACAC ACATTICABNA CROCASCAC CRACOSTCC 104 CACACACAC ACATTICABNA CROCASCAC ACACCT ACACC						
751 TOGESCHASS CERNALTITI TOGESCHOEPS POUTSCTTEC TESTIGETCA 351 TITCHESAGE CENTITICES ACCESSIONAL CARROCCESS ACRECATES 351 TITCHESAGE SECUCIONE COSSISCICA CONTROCESSIONAL CON						
301 CTICTISSAC CTETTICTISC ACCOSEGICA CARGOCORGE ACRAGOCORGE ASSESSACIANT STATEMENT RECONSCIPLING CONFIDENCE OTOTOSCORE ORGAGOCORGE ASSESSACIANT ASS						
351 TISCHBARM BRODECETC COSPICION TOTTORICH BRODECTS BRODECTS COSPICION TOTTORICH TOTTORICH TOTAL ATRICATORS COSPICION TOTTORICH TOTAL ATRICATORS COSPICION TOTTORICH TOTAL ATRICATORS COSPICION TOTAL ATRICATORS COSPICION CONCRETE COSPICION CONCRETE COSPICION CONCRETE COSPICION CONCRETE COSPICION ACCONTRATOR CONCRETE COSPICION CONCRETE CON		CTTCTGGACC	CTOTTTCTGC	ACCCGCGCGA	CATRCCGCGC	ACGAGCCACT
301 ATCACTORY TOSEGNACIA COGNACIONA TOSTITOSPIC TOTACATIGOS 51 CACCITIFOS TIBESTOCA COTACATOTI CACCACATTO ESPECIACIO 1001 ACAGGACOT CRASPICAC GRACOGRACO ASTITCOTECA CIGESTICANO 1015 TACAGGACOT CRASPICAC CRASPICACA CARCENTEGA ACTIVICATA 1101 CISSIFIGRATO TOSTACOTCA ACTITICABAT CRASCACCAC CICTITICOS 1115 GOUTOCCA GOTTACACCO COGNOSCIPO COCCOSCOSTO COGNOCOTCO 1201 TICCHASARIC ACECUTEGO TIMESCASA GOUCOSTACC TIACOSCOST 1215 HOSCIACAC TITECCACA TOTACACCO TOCAGGOSTO COGNOCOTCO 1216 TICCHASARIC ACECUTEGA TOTACACACO TOCAGGOSTO COGNOCOTCO 1217 STOCAGGOSTO TOCAGGOSTO TOCAGGOSTO GOUCOSCOSTO 1218 HOSCIACACO TITECCACA TOTACACACO TOCAGGOSTO GOUCOSTOCATO 1218 HOSCIACACO TITECCACA TOTACACACO TOCAGGOSTO GOUCOSTACOT 1218 HOSCIACACO TITECCACACO TOCAGGOSTO GOUCOSTACOT 1221 HOSCIACACO TITECCACACO TOCAGGOSTO GOUCOSTACOT 1222 HOSCIACACO TITECCACACO TOCAGGOSTO GOUCOSTACOT 1223 HOSCIACACO TOCAGGOSTO TOCAGGOSTO GOUCOSTACOT 1224 HOSCIACACOT 1224 HOSCIACACO TOCAGGOSTO TOCAGGOSTO GOUCOSTACOT 1224 HOSCIACACOT 1224 HOSCIACACOT 1225 HOSCIACACO TOCAGGOSTO TOCAGGOSTO GOUCOSTACOT 1224 HOSCIACACOT 1225 HOSCIACACOT 1224 HOSCIACACOT 1225 HOSCIACACOT						
351 GACCITTEGG TITESCUTECA COTACITETT CACCIACTTT GOSPICAGOC 1031 ACAGGICACO GAGOGICAGO SASTOCICAGO SAS		ATGCACTCGT				
1001 ACASCACCT CRACETCACC CRACEGRAGE ARTICUTECA CIGERICAN 1015 TAGESCEGE TREACAGEAC CALOSTICE AMERICAN SHITCATCA 1101 CTESTEGATE TOSTACCTA ACTITICASAT CRACEACCAC CICTITICOST 1115 GOSTOCOCA SOTTAMOS COSCOSOTOS COCCOSOTOS COSTACC 1201 TECRMARCA ACESCATES CITAGOS COSCOSOTOS COSTACC TITACOSOTO 1201 TECRMARCA COSTACCACO STECCAMAS COSCOSTACC TITACOSCOTO 1221 TECRMARCA STITECCAMAC TRACEGOS SEGECAMAS COSSECCAS		CACCTTTGGC	TTTESCTSCA	CCTACATCTT	CACCAACTTT	GCGGTCAGCC
1951 TACSCOSCIS TROCACACIAC CAACOTOTIC ALCONOTICOT SOTTCATCACT 1010 CTGSTGGATOT TOCENCICA ACTITICAGANI CGAGACACAC CTGTTCCGT 1151 CGCTGCCCA GCTCACCACAC TCGTTCCACCT 1201 TTCGAGAAGC ACGCCATAC TTACACCAGC GCCCCTACC TTACACCAG						
1101 CTSSTSGATS TOSTACCTCA ACTITICADAT CRASCACCAC CTCTTTCCST 1151 CSCTSCCCCA SCTCAACSCC CCGCSCSTCS CCCCGCSCST CCSCSCCTC 1201 TTCSASAASC ACSSCATSSC TTACSACCBS CSCCCSTACC TTACCSCSCS 1 1251 TSSCSACACS TITSCCAACC TSCACCSCCST SGSCCAAAAC SCSSSCCASS		TACRCCRCGC	TECACACGAC	CAACGTGTCC	AACGACTCGT	SGTTCATCAC
1151 CBCTRCCCA BCTCAACBCC CCBCBCBTCB CCCCBCBCBT CCBCBCCCTC 1201 TTCCABGAAGC ACBBCATBGC TTACGACBAG CBCCCBTACC TTACGACBCI 1251 TBGCGACACG TTBCCCAACC TBCACBCCBT BGGCCAAAAC BCEBBCCABG		CTGGTGGATG				
1251 TEBOGACACE TTTECCAACC TECACECCET SEECCAAAAC SCESSCCAES						
1251 TEBOGACACE TTTECCAACC TECACECCET SEECCAAAAC SCESSCCAES						
1301 CGGCGGCCAA GGCCGCTTAG	1301					

Figure 7

Amino Acid Sequence of Delta 5- Desaturase from Thankshichytrium suurum (ATCC 34304)

1	MERGGEGOVN	SACYAQGGAG	TRKTILIEGE	Y YDY TNE RH P	egsiike ltt
51	DG TE AVDATN	AFRE FHCR SG	KAEKYLKSLP	KIGAPSKOOKE	DAKEQARRDA
101	ITRDYVKERE	emvaeg de KP	APIHIVYREA	ETABLEARSE	Y LE SMRGNYE
151	ATLAAIAVGG	INCERCONIM	HECGHE SMTG	Y IPEDVRLQE	Lyygygc sms
201	ASHITRYCHIK	инатеркьки	DADPDAPER	AFNEK TAAKV	r DG SE QAKK L
251	SAQAYIFAPV	SCELVGLENT	LETH ERHMER	T SHE AEMAAY	AVRVYGHRAL
301	MASEGYSGSD	Segl ymateg	FGCTYIETNE	AVSHTHEDYT	E ADEL THAAE
351					PRYAPRYRAL

AGGCCACAGA	ATTGACGGGC	CATCATCAAA	AAGCGTACAA	AACTCCCTGC	GGAGCAGGCT	AACAGCTCGT	TACAGATGCG	CTCCTTCAAG	GGTGCGTGCA	AGCATGACCG	CGGAATTGGG	AGCACCACGC	CTTCCTCTTG	TAGCTTCCAG	TCTCCTGCCT	CACATGATCC	CTACGTATGC	AGTCTCTGGG	TTTACGCATT	CGAGTACCTG	CCATCGACTC	ATCGAGCACC	CTCTTCTCGC	CCCGCTCATA	GTGGGCGTCA	
GAGCCAAGGC	GGTGTTGCTC	CTGGTGGCTC	GATGCAACCG	CAAGTACCTC	ACGACGCAAA	GCICICCGCG	CCACATTATC	TCTACCTTTT	GTGATTGGGG	TGGCCACTAC	AGTTTTTGTA	CAGCACAACA	TITGGACACT	TCAAGCCAGG	TTTGCCCCAG	GCATCCTCGC	TCGCTCTGCG	ACTGTCGGAG	TACCTACATC	CCGAGGAGGA	ACGAACGTTG	CAACTTTCAG	ACCCTGCAAT	GTATACGACG	CCTACACGAA	ATCTCGAG
AGCACAGGGA	AGCAGCGTAA	TTCAGGCATC	GGAGGTAGTT	CGAAGGCGGT	AAGTACAAAT	GGAGTATGTA	CCAGCCCGCT	GCTCTCTCGT	TGCTGCCATC	TGCATGAAGC	CGCCTTCAAG	GTGGAGAAGC	ATGACGTTGA	GCCCGTCGCG	GGGATACATC	CTTTGTACTT	ATATTTTCTG	CATGGGCTAC	GACTTGGCTG	TTGCCAGTGT	GCTGCACACC	TGAGCTACCT	CAGTTCCGCC	CAATGGTCTG	CCTTCGGCAA	AGCGAGTAAG
TGGGTCGCGG	AGCCCAAGTG	TGCAACCAAC	CCGATGGCAA	TGCAGATCCT	CGGCCCAATC	AACTCACGAG	TACTTTGACC	AGCCATGTTC	TGGCCACTAT	GGGTGGCTCA	TGTTGACTTG	GCGGGGCTTG	AAGCTCAAGC	CGAGAAAATT	TTCATCTCCA	CTCTTCTGGA	CAACTTCGAG	TICTITICAG	CTTACTTTG	CCACACCCAC	AGTACGCTGC	ACCTGGCTGA	TIGCIGCCCG	TTTTCGAGGA	CTCAAGGATA	AGCTGCCAAG
GAATTCACCA		AGCTGTACGA	TATTTGTGCA	GGAGTTCCAC	CAAAGATCGA	CGCCATGACA	CAAGGAGGGA	CCGAGTTGGC	GGTAACGTCA	GGGTCGTTGT	GAACATCCC	TGTGGCATGA	CACCCCCCAA	TCGCCTGGAA	GCAAAGTGGC	TCTCGTTGGT	GCACCAAGCG	TGGTTCTCGC	TCTCTATGTG	TTGCTGTAAG	CACTGGGTCG	GTACGTTGTC	ACTIGITACC	GTCAAGAAAC	CGTCCAGGCG	ACGCTGGCCA
,-	21	0.1	51	01	51	101	121	101	121	501	551	102	551	701	751	301	351	106	951	100	051	101	151	201	251	301

Start/stop underlined

- 1 MGRGAQGEPR QATELKSSPS EQRKVLLIDG QLYDATNFRH PGGSIIKYLC
- 51 TDGKEVVDAT BAYKEFHCRS SKAVKYLNSL PKIDGPIKYK YDAKEQARHD
- 101 KLTREYVALR EQLVKEGYFD PSPLHIIYRC AELAAMFALS FYLFSFKGNV
- 151 MATIAAIVIG GCVQGRCGWL MHEAGHYSNT GNIPVDLRLQ EFLYGIGCGM
- 201 SGAWWRSQHN KHHATPQKLK HDVDLDTLPL VAWNEKIARR VKEGSFQAKW
- 251 LHLQGYIFAB VSCLLVGLEW TLYLHPRHMI RFKRNFEIFS VALRYVCWFS 301 LLLSNGYTVG ESLGLYVLFF GLGCTYIFTH FAVSHTHLFV SEEDEYLHWV
- 351 EYAALHTINV AIDSYVVIWL MSYLNFQIEH HLFPCCFQFR HPAISSRVKK
- 401 LFEDNGLVYD ARSYVQALKD TFGNLHEVGV NAGQAAKSE

	E	TAGAAAGCTA	CAAGGCGCAG	CAAAGAAAGC	1351
AAGCGCGCCC	GAACGGTGTC	ACTACCATGA	GTCGGTTCCC	TCTTGCTGAC	1301
TGCTCCAAAA	-	-	TCGICICITA	AACTACCGCG	1251
ACACGGCCTC	TCGCCAAAAA	TTTGCCATCT	CTCACGCCGC	AGGTCGAGGT	1201
CAGTACCACC	TGCCATGCCC	ACTTGTGGCC	ACCATCCACC	CAACATGCAG	1151
TGGGTTACCT	TGCTGGGTCA	CCCGCTCGTG	GCCCATCCAA	GTTGACATCA	1101
TGACCACACT	GGTACGCTGT	AACTGGGTCA	CGTGCATAAG	TGGAGGCGGA	1051
ATGGACATTG	CCACACTCAT	TTTCGCTCTC	TTTGGCCACT	TATGTATTTG	1001
GGGTGTCCGG	GCGTGCATGT	TGGGTATTGG	GCTACCTTGT	CTCGCTGCAT	951
CTGGGAGAGC	TIGIGACCGG	CTCTTCCACC	GCGCACCTAT	GCCACATTGT	901
ATGCTGTCGA	GGGTTTTTGG	ACTITICAGGA	CAAAAGAAGA	CCGCGTCGTT	851
TCCACCCTCG	CIGITITITIC	GCTGTTCTGG	TGATCGTCAT	ACCAGCGGCA	801
CATTCCTGTC	CTTTCACGTT	CGCTTTCAGG	GGCTTGGGTC	GCTTTTCCAA	751
AGATGGAAGG	TGAGAAAAAC	ACACTGCATT	GCTTTCTTCA	TCCTTTTGTA	701
TTGACACAAC	GACCTTGACA	GGTTCATCAC	CCACCCAAAA	CATCATGCTG	651
GCACAACAAG	GGAACATGAT	GGCGACATGT	AGGAACATCC	GGTTTGGTCT	601
ATGTTGATCG	TGIACAGGCC	GGGGCAAGCG	AGCCTTTGGT	CTTTTTAC	551
GCCACGGCTC	CATGAGGCAG	ATGGTGCCAG	CATTCTGTGG	CTCTTTGGTG	501
CGTCCACGGT	CTGGTGTCCT	TCTATIGCTG	CACTCCTCTG	TCTCGTTAAA	451
CTCTACCTCT	CACGCTCGGC	TAGGTATGTT	TCAGAGCTTG	TTACAGATTA	401
GGCATCGCGC	CCTTCCTTCT	ATTGATGGAA	GCCGGGATGG	GATGAGATTC	351
AAAATTTGAG	GTGATTTTAA	GAGATGCTGC	CAAGGAGGCG	AGGAGCAGAC	301
CAGCTTCCAG	CCAGCCAAAC	TCCTCGAGAT	CGTGCTCCGG	TCTCCCAAAG	251
TGCTCAAGTC	GCTCAGATGG	CTCAAAGAAG	TCCACATGCG	TTTGAAGCGT	201
CACGICCCIC	GCGCTGATGC	GCCAACACCG	GTACGGGCTT	GCGTGATCAA	151
CCTGGTGGCA	CAGAAAACAC	CGGACTATCT	TACGACGICA	TGGAGTCGAA	101
TTCGCATCAA	GAGGATGTTG	GGCCAAGTGG	AGCTCCAGAA	AAGACCGAGC	21
GCAGCCACAA		AAAAGCGAGG	CGGCGGCGAG	CCATGGGCCG	H

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1 HGRGGEKSEV DGVQPGWTED LGKANWEDDV RINGUEPDT DTLAKHFGGGS
51 VIKYGLANTG ADATSLEAR HARSKAGAV LKSLEKARV LEIGPWQLPE
101 EGYKEARALR DEWKEPDEIR ROGIAEPSFW HAAVRISELV GMFTLGLYLF
151 SLATPELSIAA GVIUHGLEGA FOGNOGHEAG HGSFFYSLWW GKRVQPMLIG
201 EGKANWEDGA FUTIEVYSGW IVALFWLFFL HRRVVQKKN FEBGFRMLSS
301 HYNGTYLEHL VTGWESLACO YLVGYWACHW GYLNMGYTHEH LWFANDDYY
351 EADVHRNNWYR YAVDHTVDIS PSNPLVGWW GYLNMGYTHH LWFANDGYYG
401 VEVSRRFALF AKKHGINYRV VSYFEAMRLA LQNLADGGHH YHENGYKRARA

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51	ATTGCCCCGT		GCGCGACCAA		TCTGAGGCGG
101	CCGACGTCAC	CGTCTCTAGC	ATCGATGCTG	AAAAGGAGAT	GATCATCAAC
151	GGCCGCGTGT	ATGACGTGTC	GTCATTTGTG	AAGCGGCACC	CAGGTGGCTC
201	GGTGATCAAG		GCGCCGACGC		
251	TTCACGTCCG	CTCCAAGAAG	GCGGACAAGA	TGCTGTATTC	GCTCCCGTCC
301	CGGCCGGCCG	AGGCCGGCTA	CGCCCAGGAC	GACATCTCCC	GCGACTTTGA
351	GAAGCTGCGC	CTCGAGCTGA	AGGAGGAGGG		
401	TGCACGTGAG	CTACAGGTGT	GTGGAGGTTC	TTGCCATGTA	CTGGGCTGGC
451	GTCCAGCTCA	TCTGGTCCGG	GTACTGGTTC	CTCGGCGCGA	TCGTGGCCGG
501		GGCCGCTGCG			GGGCACTACT
551	CGCTCACCGG	CAACATCAAG	ATCGACCGGC		
601		GCGGCATGTC			AGCACAACAA
651	GCACCACGCC	ACGCCGCAGA	AGCTCGGGAC	CGACCCCGAC	CTGCAGACGA
701	TGCCGCTGGT		AAGATCGTCG		
751	GGCAAGGCGT		GCAGGCGCCG		
801	CTGCTCGCTC	GTCTCTTTCG	GCTGGCAGTT		
851	CGCTGCGCGT	GCACAATCAC		CGTACATGGG	
901	GTGCTGTGGC	ACCTGGCCTT	TGGCCACCTC	GGGCTGCTGA	
951	CCTGTACGCC	TTTTACGTGG		CACCTACATC	
1001	TCGCCGTCTC		AAGGACGTCG		CAAGCACATC
1051	TCGTGGGCAC	TCTACTCGGC	CAACCACACG		
1101	CTTTGTCAAC	TGGTGGATGG		CTTCCAGATC	
1151	TCTTCCCGTC	GATGCCGCAG	TACAACCACC		
1201	CGCGCGCTCT		CGGGGTCGAG		GGCCATACCT
1251	GGAGTGTTTT	CGGGTCACGT	ACGTCAACCT	GCTCGCCGTA	GGCAACCCGG

1	MVAGKSGAAA	HVTHSSTLPR	EYHGATNDSR	SEAADVTVSS	IDAEKEMIIN
51	GRVYDVSSFV	KRHPGGSVIK	FQLGADASDA	YNNFHVRSKK	ADKMLYSLPS
01	RPAEAGYAQD	DISRDFEKLR	LELKEEGYFE	PNLVHVSYRC	VEVLAMYWAG
51	VQLIWSGYWF	LGAIVAGIAQ	GRCGWLQHEG	GHYSLTGNIK	IDRHLQMAIY
01	GLGCGMSGCY	WRNQHNKHHA	TPQKLGTDPD	LQTMPLVAFH	KIVGAKARGK
51	GKAWLAWQAF	LFFGGIICSL	VSFGWQFVLH	PNHALRVHNH	LELAYMGLRY
01	VLWHLAFGHI	GLLSSLRLYA	FYVAVGGTYI	FTNFAVSHTH	KDVVPPTKHI
51	SWALYSANHT	TNCSDSPFVN	WWMAYLNFQI	EHHLFPSMPQ	YNHPKIAPRV